

## Description

### 1. Title of the Utility Model

An ink recovering and rinsing device for an ink transfer mechanism

### 2. Claim(s)

What is claimed is:

An ink recovering and rinsing device for an ink transfer mechanism comprising an ink transfer mechanism having an anilox roller, an inking roller, and an ink supply tubing system located toward between said rollers, said mechanism further comprising a tubing system for selectively recovering ink or rinsing water, a high pressure air blowing out tubing which one end is in fluid communication with said ink and rinsing water selective recovery tubing system, wherein the air blowing out direction of the high pressure air blowing out tubing is directed in the same direction as the recovery direction of the ink or rinsing water in said ink and rinsing water selective recovery tubing system.

### 3. Detailed Description

This Utility Model is related to an ink recovering and rinsing device for an ink transfer mechanism, more particularly, quick recovery and rinsing operations of the ink in the ink and rinsing water selective recovery tubing system can be provided when an ink color change operation is required in order to adapt a printing order change, whereby greatly reduced setting-up time of the printing machine and saving of the ink and rinsing water can be obtained.

A flexographic ink printing machine has, for example, as shown in Figure 1, an ink transfer mechanism having an anilox roller 10, an inking roller 12, and ink supply tubing 26. Ink is drawn from an ink reservoir 14 via a pump 16 and supplied in a contacting area ALPHA formed between the rollers 10, 12. The supplied ink is uniformly squeezed between the rollers 10, 12 and coated on the surface of the anilox roller 10, and thereafter, transferred onto a printing die 20 mounted on a printing cylinder 18. In the drawing, 22 shows an impression cylinder, and 24 shows an ink recovery box.

In the operation of such printing machine, when one printing order has finished, an ink color change operation has to be done for a new printing operation using another ink. Thus, the ink used in the previous order and still adhering on the surface of the rollers 10, 12 and inner surface of the ink supply tubing 26 have to be recovered, and thereafter, rinsing water is supplied in such an ink adhering area for rinsing the ink out, before supplying another colored ink. However, because of the viscosity of the ink being held in the ink recovery box 24 and adhering in the tubing system 26, the recovery of such ink by its gravity takes long time, so that some ink remained even after the recovery and to be rinsed out by the rinsing

water, thus a large amount of ink is wasted using a large amount of rinsing water.

The object of this Utility Model is to provide quick recovery and rinsing operations of the ink in a printing machine when an ink color change operation is required in order to adapt a printing order change, so as to provide quick rinsing operation and saving of the ink and rinsing water.

Thus there is provided an ink recovering and rinsing device for an ink transfer mechanism comprising an ink transfer mechanism having an anilox roller, an inking roller, and an ink supply tubing system located toward between said rollers, said mechanism further comprising a tubing system for selectively recovering ink or rinsing water, a high pressure air blowing out tubing which one end is in fluid communication with said ink and rinsing water selective recovery tubing system, wherein the air blowing out direction of the high pressure air blowing out tubing is directed in the same direction as the recovery direction of the ink or rinsing water in said ink and rinsing water selective recovery tubing system.

Now, a preferred embodiment of the Utility Model will be explained in detail with reference to the drawings. Figure 2 is a schematic perspective view of the ink recovering and rinsing device of the preferred embodiment which includes the ink transfer mechanism known in the art and shown in Figure 1. Thus, inserted in the ink reservoir 14 is one end of the tubing, the other end of which is located above the longitudinal contacting area ALPHA between the anilox roller 10 and the inking roller 12, and ink in the ink reservoir 14 is constantly supplied by this ink supply tubing system 26. Connected to this ink supply tubing system 26 is a rinsing water supply tubing system 28 connected to a rinsing water supply source, and rinsing water is supplied to the tubing system 26 when a switching valve (not shown) is so operated.

Ink recovery boxes 24, 24 are disposed at the longitudinal ends of the anilox roller 10 and the inking roller 12, and when ink is supplied between rollers 10, 12 via the ink supply tubing system 26, an excessive ink flows in the longitudinal direction along the contacting area ALPHA, and thereafter collected in the ink recovery boxes 24, 24, respectively. Connected in fluid communication with the bottoms of the ink recovery boxes 24, 24 are the opening ends of the tubing system 26 for selectively recovering ink or rinsing water therefrom. The other opening ends of the ink and rinsing water selective recovery tubing system 30 are, as shown, connected to a common tubing system 32, which is connected to the ink reservoir 14 via a switching valve 34. The common tubing system 32 is also connected to a drain tubing 36 at the switching valve 34. Therefore, the ink supplied between rollers 10, 12 via the ink supply tubing system 26 is collected in the ink recovery boxes 24, 24, and thereafter returned into the ink reservoir 14 via the ink recovery tubing system 30 and the common tubing system 32 by the gravity, whereby obtaining a natural circulation of the ink.

Next, connected in fluid communication with the ink and rinsing water selective recovery tubing system 30 is one end of the high pressure air blowing out tubing 40 connected to a high pressure air source 38. Preferably, as shown in Figure 3, the opening end of the high pressure air blowing out tubing 40 is located upstream of the switching valve 34, and the air blowing out direction of the high pressure air blowing out tubing 40 is directed in the same direction as the recovery direction

of the ink or rinsing water in the tubing system 30 (shown by an arrow A in Figure 3). In other words, the air blowing out direction of the high pressure air blowing out tubing 40 is directed toward downstream of the ink and rinsing water selective recovery tubing system 30.

Next, the operation of this embodiment will be explained in detail below. In the embodiment shown in Figure 2, the ink supply pump 42 is rotated for drawing the ink from the ink reservoir 14 and the ink is supplied between the rollers 10, 12 via the ink supply tubing system 26. When ink is supplied between rollers 10, 12, an excessive ink flows in the opposite longitudinal directions along the contacting area ALPHA formed between the rollers 10, 12 and collected in the ink recovery boxes 24, 24, respectively, and thereafter returned into the ink reservoir 14 via the ink and rinsing water selective recovery tubing system 30 in a circulative manner.

Now, let it be assumed that one printing order has finished, and an ink color change operation has to be done for a new printing operation using another ink. At this time, the ink supply pump 42 is stopped and ink supply is stopped as well. Next, high pressure air is blown out from the high pressure air blowing out tubing 40 to the ink and rinsing water selective recovery tubing system 30 which is connected to the each of the bottoms of the ink recovery boxes 24, 24 disposed at both ends of the rollers 10, 12. At this time, because the air blowing out direction of the high pressure air blowing out tubing 40 is directed in the same direction as the recovery direction of the ink or rinsing water in the tubing system 30, thus a negative pressure is generated in the upstream portion of the tubing system 30. Therefore, the ink adhering on the tubing system 30 is positively recovered into the ink reservoir 14 under the suction effect.

Then, the switching valve (not shown) disposed in the ink supply tubing system 26 is operated so as to supply the rinsing water through the rinsing water supply tubing system 28 to the ink supply tubing system 26 and the ink adhering area of the rollers 10, 12, whereby adhering ink is rinsed out. At the same time, the switching valve 34 disposed in the common tubing system 32 is operated so as to connect the tubing 32 to the drain tubing 36. The waste water used for rinsing out is collected in the ink recovery boxes 24, 24, and thereafter flows into the ink recovery tubing system 30. Again, because high pressure air is being blown out from the high pressure air blowing out tubing 40 to the ink and rinsing water selective recovery tubing system 30 and the air blowing out direction of the high pressure air blowing out tubing 40 is directed in the same direction as the recovery direction of the ink or rinsing water in the tubing system 30, thus a negative pressure is generated in the upstream portion of the tubing system 30. Therefore, the rinsing water flowing in the ink recovery tubing system 30 is positively recovered under the suction effect and ejected out of the the drain tubing 36 via switching valve 46.

According to the ink recovering and rinsing device for an ink transfer mechanism described above, quick recovery and rinsing operations of the ink in the ink and rinsing water selective recovery tubing system can be provided when an ink color change operation is required in order to adapt a printing order change. This device also provides a saving of the ink or rinsing water and greatly reduced setting-up time of the printing machine. Moreover, this arrangement can be realized

by only providing a high pressure air blowing out tubing in such a manner that which one end is in fluid communication with the ink and rinsing water selective recovery tubing system already installed on an existing ink transfer mechanism, which modification is easy and does not need significant costs. Although in the embodiment described above, high pressure air was supplied from high pressure air blowing out tubing 40 to the tubing system 30 in order to provide quick ink color change operation required upon a printing order change, this embodiment can also be used for promoting circulation of the ink during a normal printing operation if high pressure air is supplied during such normal printing operation of the printing machine.

#### 4. Brief description of the drawings

Figure 1 shows an ink recovering and rinsing device for an ink transfer mechanism known in the art; and Figures 2 and 3 show an ink recovering and rinsing device in accordance with this Utility Model.

- 10 - anilox roller
- 12 - inking roller
- 26 - ink supply tubing system
- 30 - ink and rinsing water selective recovery tubing system
- 40 - high pressure air blowing out tubing